

# OSCILLATOR MODULE INCORPORATING LOOPED STUB RESONATOR

## ABSTRACT OF THE DISCLOSURE

[0066] A transmission line configured as a looped-stub resonator is disclosed, which can be used as a frequency selective element for an oscillator, such as a VCO of a phase locked loop. The transmission line is a fraction of an electrical wavelength, and can be embedded to provide an inner resonant layer of an overall layered structure. The transmission line is formed into a loop or multiple loops and may be terminated with a capacitor, short circuit, or open circuit. In the embedded case, dielectric insulating material can be used to surround the transmission line on top and bottom surfaces as layers. In addition, electrically conducting material layers can be used to surround the dielectric insulating material.